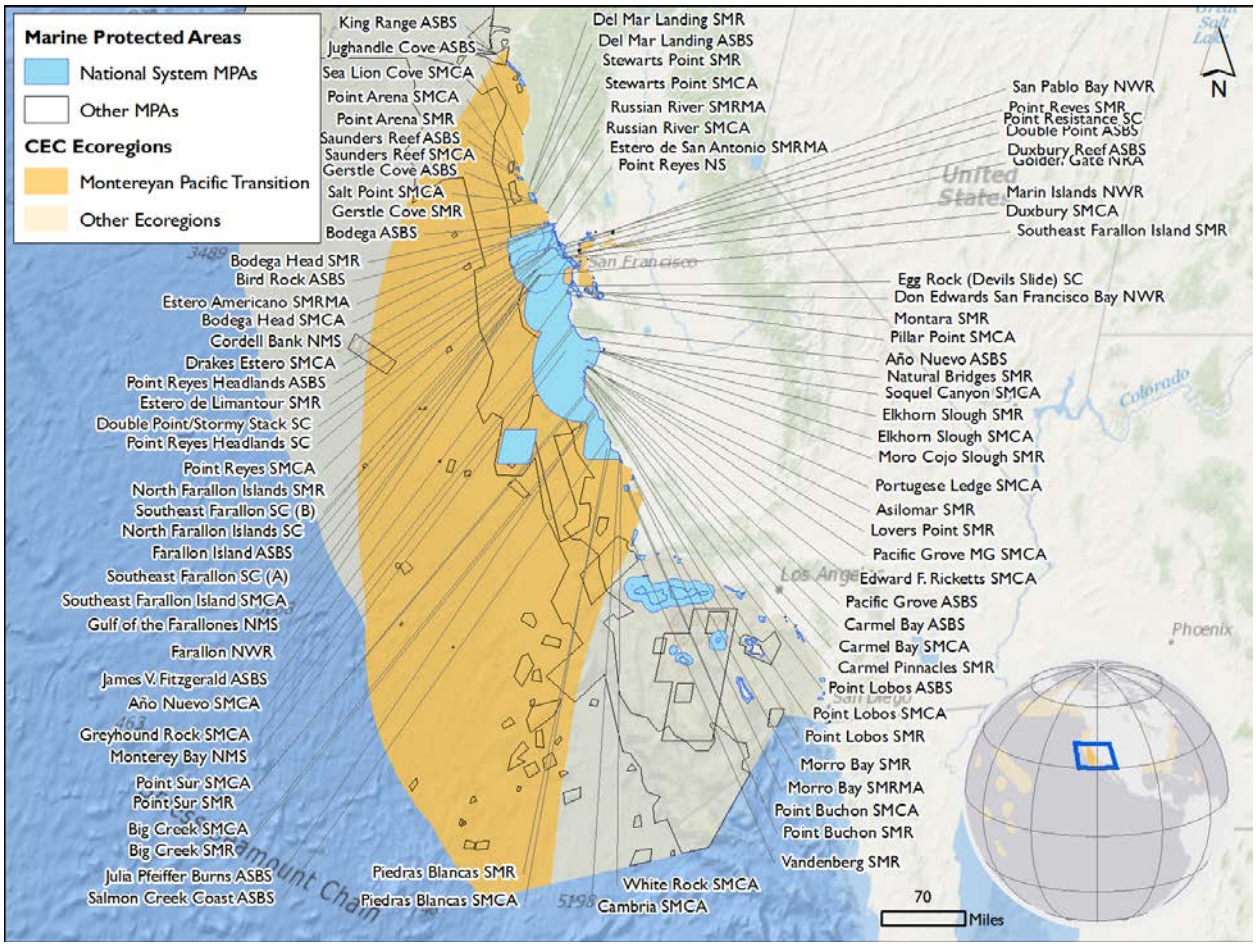
Montereyan Pacific Transition (Ecoregion 20)

Background

The Montereyan Pacific Transition stretches along the California coast from Cape Mendocino to the north and Point Conception to the south. At Point Conception and northwest of Los Angeles County, the ecoregion boundary moves offshore into open waters and doesn't abut the coastline again. The ecoregion consists of a very nearshore steep continental shelf and slope, leading to spectacular submarine canyons and deepwater species. These canyons act as a conduit for sediment and other nearshore materials to transport off shore to the deep-ocean floor. The California Current is the ecoregion's dominant physical entity, leading to major upwelling areas in the ecoregion and moderately high productivity in the region. Due to cold temperate and subpolar mixing, this ecoregion is also host to many transitional species.



MPAs in the Montereyan Pacific Transition

Of the 116 MPAs in the Montereyan Pacific Transition Ecoregion, 88 (76%) are National System members, 27 (23%) are eligible but are not currently National System members and only 1 (1%) are not eligible (Figure 1). The vast majority of National System MPAs in the ecoregion are

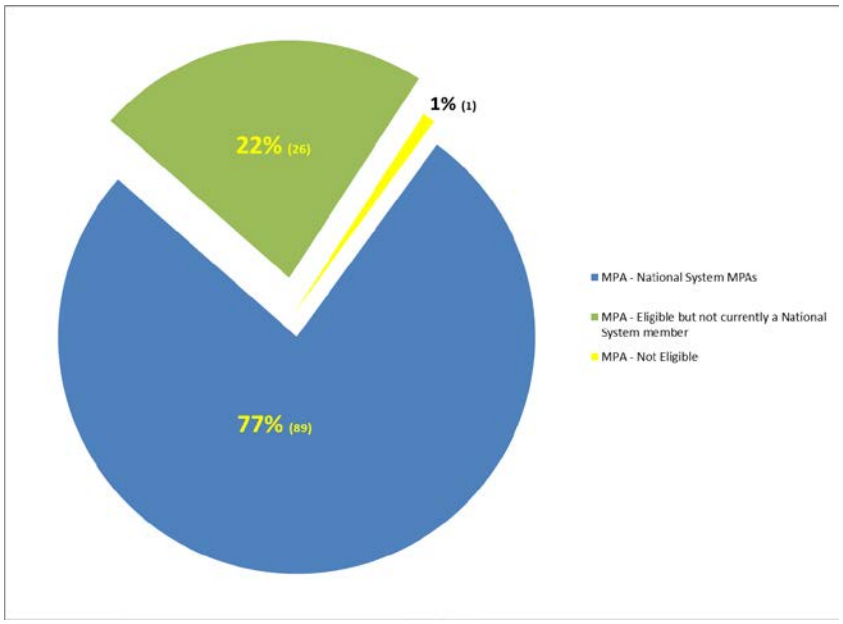


Figure 1. Percent of Marine Protected Areas (MPAs) within the Montereyan Pacific Transition (Ecoregion 20) that are members of the National System of MPAs (n=116)

marine conservation areas managed by the California Department of Fish and Wildlife and water protection areas managed by the State Water Resources Protection Control Board. The ecoregion also contains several national marine sanctuaries (Cordell Bank, Gulf of the Farallones, Monterey Bay), Point Reyes National Seashore, and national wildlife refuges (San Pablo Bay, Marine Islands). Millions of San Francisco residents and visitors access the shoreline at the Golden Gate National Recreation Area. Most other MPAs in the ecoregion are managed by the NOAA Fisheries Service as Essential Fish Habitat (EFH) Conservation Areas. EFH includes all types of aquatic vegetation (wetlands, coral reefs, seagrasses), rivers (where fish spawn, breed, feed, or grow to maturity) and other areas that are important to the critical life stages of certain species. Impacts from certain fishing practices as well as coastal and marine development threaten to alter, damage, or destroy these habitats.

Many of the EFH areas restrict or prohibit bottom contact gear and are primarily focused on alleviating impacts of bottom trawling and other fishing gear on the benthic and epibenthic fauna of these benthic ecosystems. In these MPAs, the sensitive habitats of ecological importance are coldwater corals (reported in 21% of the ecoregion's MPAs), deepwater seamounts (16%) and submarine canyons (23%) (Figure 2). Monterey Canyon, the deepest and largest submarine canyon found on the coast of North America, is found in the ecoregion, and several other major canyons in the ecoregion (Bodega, Carmel, Sur) also provide important deep-water habitat.

Ecologically important biogenic habitats found in other ecoregions such as seagrass (21%), wetlands and mudflats (21%), and kelp/algae (55%) are all found in the ecoregion. Giant kelp beds on rocky subtidal and intertidal areas (41%) provide surface canopy as well as food and refuge for many species (e.g., such as sea urchins). The ecoregion's productivity is fueled by upwelled water (reported to occur in 95% of the ecoregion's MPAs), as well as biogenic and non-biogenic habitats, such as the rocky reefs that are abundant along the rugged California coast (and occur in 46% of the ecoregion's MPAs). Also along the coastline are many beaches (58%) that are very important, both ecologically as well as economically.

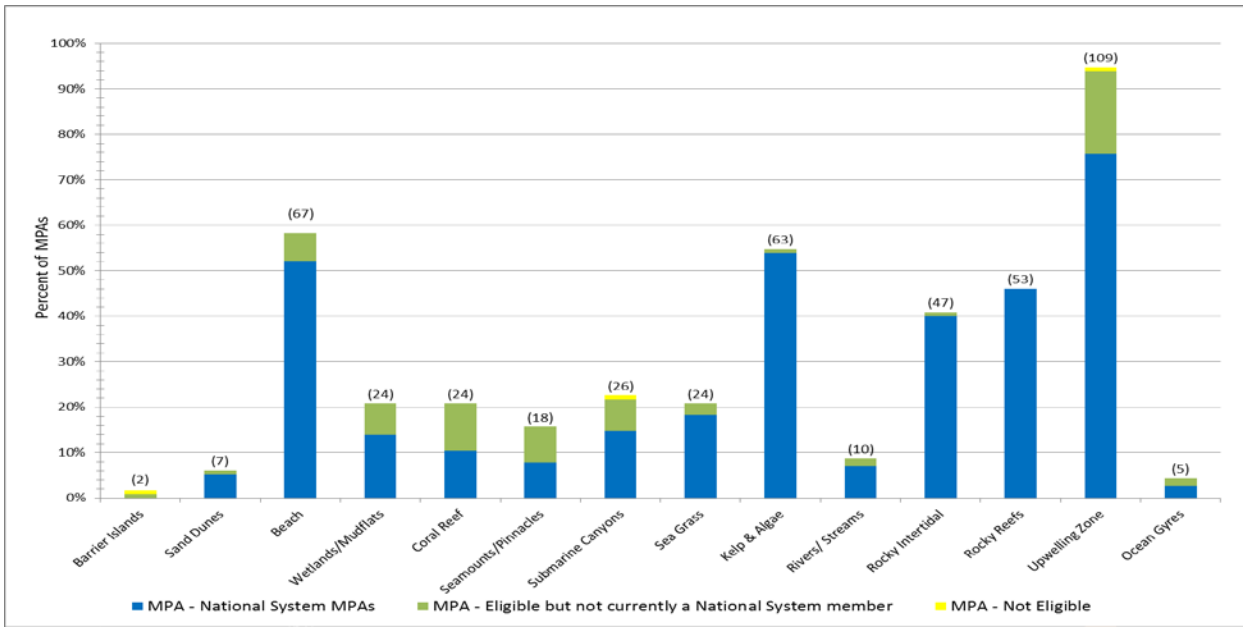


Figure 2. Percent of MPAs that contain certain habitat groups present in the Montereyan Pacific Transition (Ecoregion 20)

The mixing of cold temperate (California Current) and warmer (from Mexico) water masses passing over important bathymetric features (seamounts, canyons) support rich fisheries in the canyon offshore areas (Figure 3). Anadromous (32%) estuarine (12%) and coastal pelagic fish

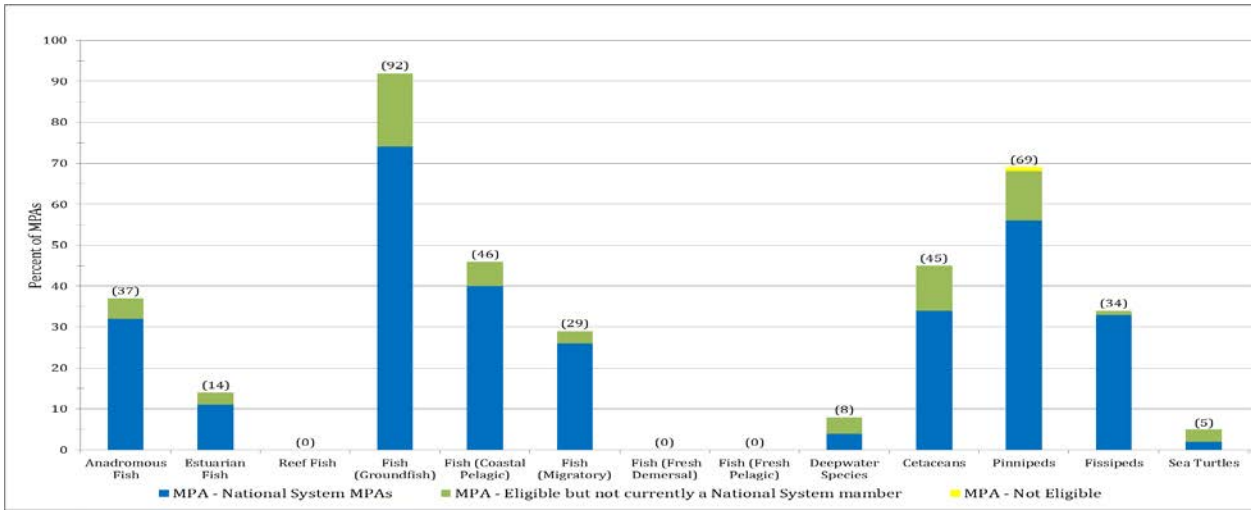


Figure 3. Percent of MPAs that contain certain fish and marine mammal groups in the Montereyan Pacific Transition (Ecoregion 20)

(40%) such as coho, chinook and steelhead salmon migrate offshore from the coast's rivers and streams during part of their life cycle. Various types of marine fishes are found throughout many of the ecoregion's MPAs, including commercially important groundfish such as cowcod and bocaccio rockfish (80%). The ecoregion also supports internationally significant populations of marine mammals, including cetaceans (found in 39%) such as blue and sperm whales that

favor the deep and temperate waters and coastal migrating gray whales. These productive waters also support large populations of pinnipeds such as the Stellar sea lion, northern elephant seal and harbor seal (60%), and fissipeds such as the sea otter (30%), important predators as well as prey species.

Birds are classified as waterfowl, estuarine or seabirds, signifying where their principal feeding areas occur, and are found in several of the ecoregion's MPAs (Figure 4). Coastal wetlands

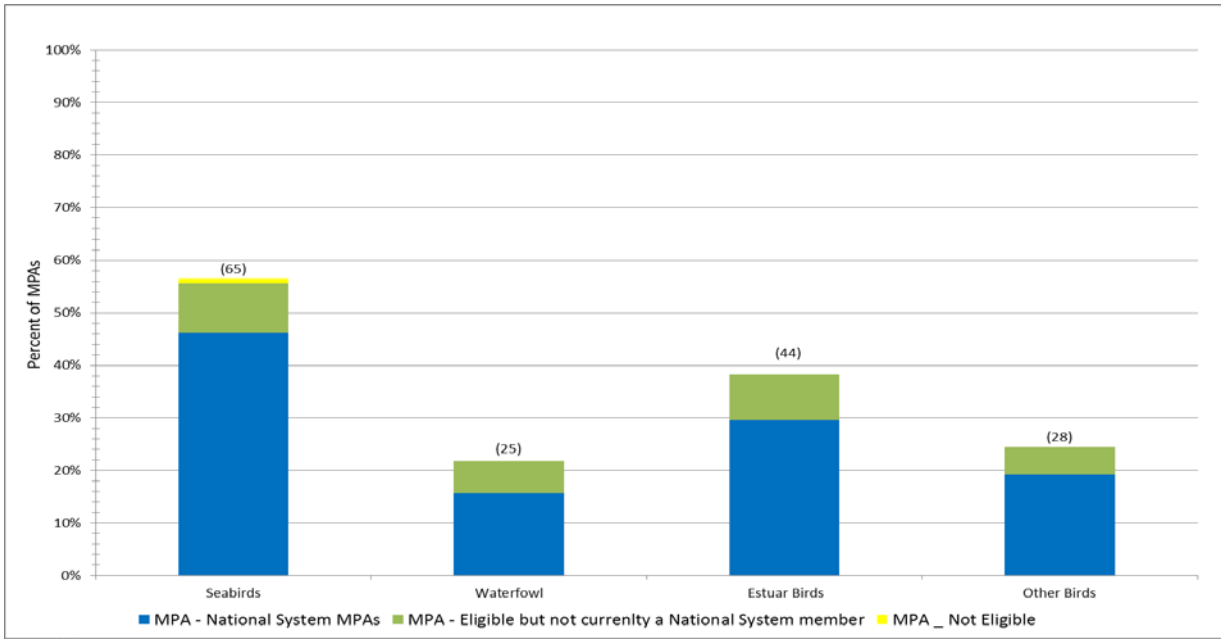


Figure 4. Percent of MPAs that contain marine birds and reptiles in the Montereyan Pacific Transition (Ecoregion 20)

associated with estuaries support millions of shorebirds during spring and fall migration, and resting over winter months. San Francisco Bay is the largest estuary in the region and is a major area for migrating birds. Waterfowl (22%) from rivers and streams and estuarine birds (38%) take advantage of the areas coastal resources for many of their life stages. Seabirds (57%) such as albatross, shearwaters, brown pelicans and gulls are found throughout the ecoregion due to the area's high productivity. Birds not classified in any of these feeding guilds are found in 24% of the ecoregion's 116 MPAs.

The ecoregion's many wetlands and mudflats and submarine canyons support distinct subtidal benthic invertebrate communities (e.g., found in 78% of the ecoregion's MPAs) and a highly productive benthos (Figure 5), such as economically important Dungeness crabs. The rocky intertidal shoreline (43%) with its many tidal pools and attached benthic algae (28%) are important resources for a host of fish, mammals and bird species.

Ecologically important areas that support where species breed, nest, spawn and rest can be found throughout the ecoregion, including in some of the ecoregion's highly productive deep-water MPAs (Figure 6). Deep-water seamounts, canyons and coldwater corals and coastal

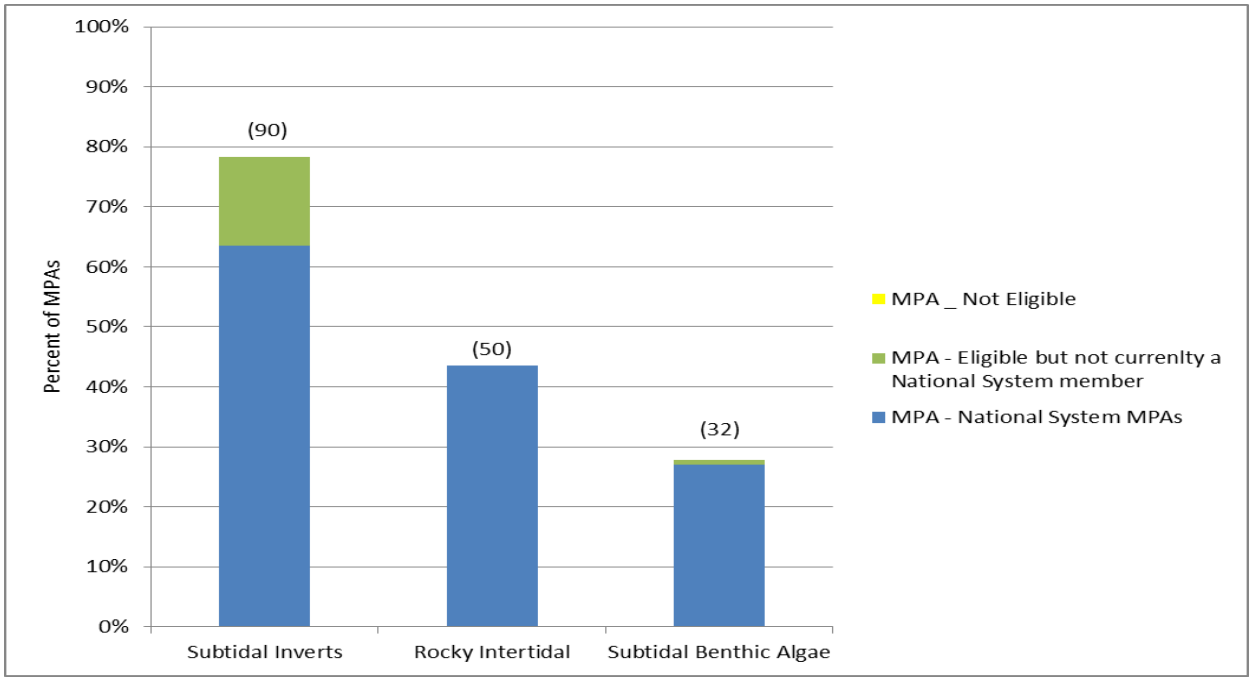


Figure 5. Percent of MPAs that contain Invertebrates and Algae in the Montereyan Pacific Transition (Ecoregion 20)

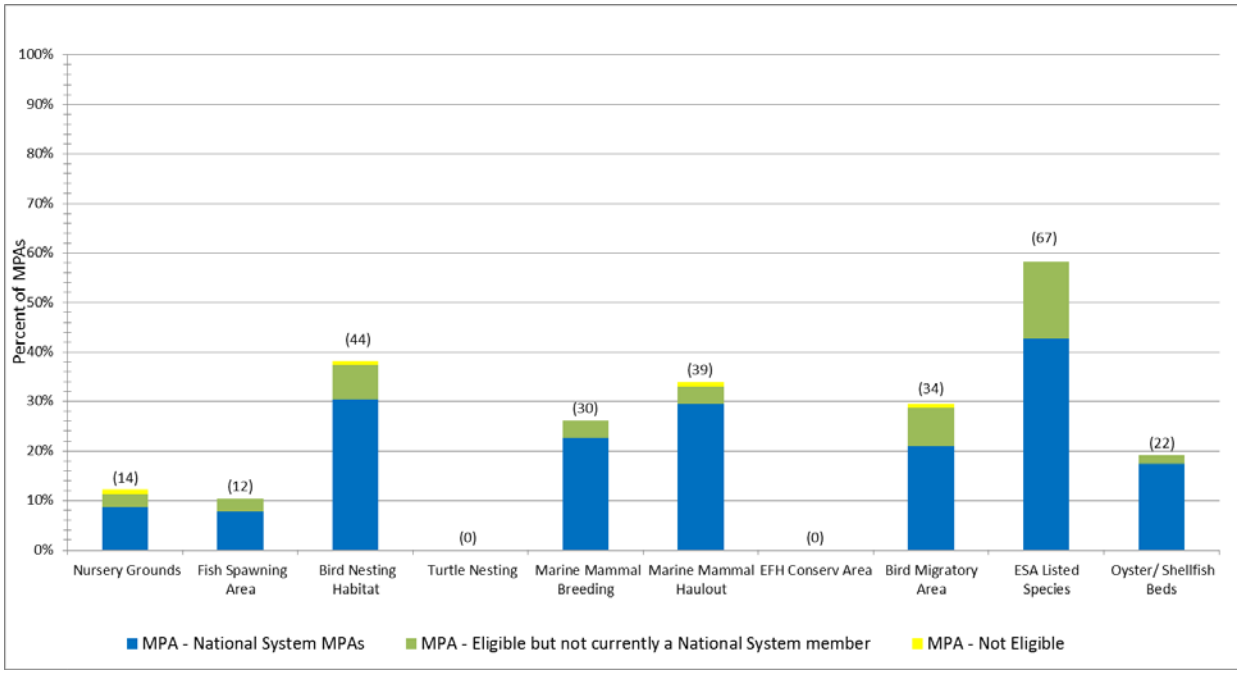


Figure 6. Percent of MPAs with ecologically important areas in the Montereyan Pacific Transition (Ecoregion 20)

wetlands and rocky areas all act as nursery grounds (12%) and fish spawning areas (10%).

Rocky shorelines also serve as places that marine mammals breed (26%) and haul out (34%). Coastal wetlands and the rocky cliffs support bird nesting (38%) and resting during seasonal migrations (30%). The NOAA Fisheries Service has jurisdiction over 102 threatened and endangered species listed under the Endangered Species Act (ESA), many of which (such as

including blue, sperm, and gray whales, seals and sea lions as well as loggerhead and leatherback sea turtles) are found in this ecoregion and in 75% of the ecoregion's MPAs.

Conclusions

The 116 MPAs in this ecoregion contain the major habitat and species groups and ecologically important areas found in the ecoregion as a whole. In some cases, these resources are also found in more than one MPA, resulting in some replication of ecological features (species, habitats and ecological processes) -- one of the criteria identified by the Convention on Biological Diversity (CBD) in designing effective MPA networks.

Suggested Reading

The Encyclopedia of Earth. California current large marine ecosystem.
http://www.eoearth.org/view/article/150853/